

MONITORING APPENDIX

Introduction

For each resource, there are a series of items that will be monitored. Each item is evaluated by location, technique for data gathering, unit of measure, and frequency and duration of data gathering. When duration is not specified, the duration is for the next 20 years. The monitoring plan states the event that will be evaluated and lists the key resources that will be monitored. If an adverse impact can be corrected by a management action within the scope of this plan, the change will be implemented. If the adverse impact can be corrected only by a management action that is

outside the scope of this plan and the Billings or Powder River RMPs, the management change will be a formal amendment.

The DNRC Technical Advisory Committee for the Powder River Basin Controlled Groundwater Area has proposed a groundwater monitoring plan for CBM development. The monitoring recommendations are incorporated into the monitoring table. A complete copy of that plan is located on page MON-9 of this appendix.

The BLM, FWS, and the state have developed a draft outline for a wildlife monitoring and protection plan. It is located on page MON-15 of this appendix.

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
AIR QUALITY	particulate matter	areawide	filters on volume samplers	µg/m ³	24-hr samples 1 - 2 times yearly	exceedance of standards - operators could be required to cooperate in a coordinated air quality monitoring program
	gaseous	areawide	gas specific analyzers	parts per million interpreted as µg/m ³	Hourly samples collected at least 1 - 2 times yearly	Exceedance of standards - operators could be required to cooperate in a coordinated air quality monitoring program
CLIMATE		areas affected by land disturbance	RAWS or COOP Stations	Bulk precipitation	daily during the growing season	extremes affecting revegetation operations
CULTURAL RESOURCES	ACECs	areawide	site inspection	site, surrounding area	bimonthly between April - November	any noticeable trend indicating increased disturbance - natural or human caused
	20 percent of National Register eligible sites	areawide	site inspection	site, surrounding area	annually	any noticeable trend indicating increased disturbance - natural or human caused
	National Register eligible sites discovered as a result of oil, gas development	areawide	site inspection	site, surrounding area	case by case	any noticeable trend indicating increased disturbance - natural or human caused
	1 percent of remaining total of sites	areawide	site inspection	site, surrounding area	annually	any noticeable trend indicating increased disturbance - natural or human caused
HYDROLOGY	surface water quality	areawide on major rivers or streams where management activities are occurring or expected to occur	standard USGS quantitative measurements of water quality, including but not limited to the common anions, cations.	standard quantitative measurements of water quality, quantity	measurements to be made daily at designated locations on rivers, perennial streams including USGS stations on the Tongue River at the state line, at Brandenburg bridge, Powder River at the state line, above Locate – on other streams, field measurements will be made 15 times yearly for 5 years and 4 times per year thereafter, unless a greater sampling frequency is determined to be warranted at that time – sampling will continue for at least 5 years after production activity ceases	water quality parameters that raises the SAR above 3 for the Tongue River or changes the parameters for any sampled stream above the state of MT water quality standards, especially suspended sediments which render the water unsuitable for its classified usages.

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
INDIAN TRUST	groundwater quantity and quality	areawide on sites of occurring activities or expected management activities with priority for development of monitoring well locations within 3 to 5 miles of the outcrop lines with a minimum of one well per township in each of the affected coal aquifers. Abandoned exploration and CBM productions wells should be converted as needed for monitoring wells (see map at the end of the Appendix)	sampling of dedicated monitoring wells in the zones of extraction and zones above and below the expected activity - wells are to be placed in the affected areas to areas unaffected by management activities—sampling of springs near well monitoring sites and the springs that are important water sources near the expected development	gpm	gpm field measurements are to be monthly for the first 3 years and reduced in frequency after baseline conditions have been established. If possible baseline conditions should be established prior to development. Monitoring needs to continue until 95 percent recovery of the baseline condition or until a recovery trend is established	when a 50% reduction in the baseline has been observed
		Areawide in drainages containing alluvium	monitoring wells will be established in stream valleys that contain alluvium and downgradient of discharge impoundments and discharge points	measurements of depth in feet	water level measurements will be taken monthly prior to production activity and during the development - water quality measurements will be taken 4 times per year	20% rise in the water table above its seasonally adjusted elevation, or a 2 unit increase in the SAR value will trigger a discontinuance of CBM evaporative ponds in that watershed, or require ponds to be lined
	groundwater	adjacent to the Northern Cheyenne & Crow reservations	sampling of dedicated monitoring wells in the zones of extraction and zones above and below the expected activity - wells are to be placed in the affected areas to areas unaffected by management activities	standard quantitative measurements of water quality - measurement of depth in feet	field measurements 6 times yearly prior to production activities, continue throughout the activity period and for the duration of 95 percent of the recovery of pre-development conditions	for drawdown measured beyond 2 miles, BLM would require the operator to provide a hydrologic barrier, for example, an injection well between the CBM well and the reservation boundary
			monitoring wells will be established near the mouth of streams that contain alluvium	measurements of depth in feet	water level measurements will be taken monthly prior to production activity and during the development - water quality measurements will be taken 4 times per year	a 20% rise in the water table above its seasonally adjusted elevation, or a 2 unit increase in the SAR value will trigger a discontinuance of CBM evaporative ponds in that watershed, or require ponds to be lined
	natural gas	areawide	drainage evaluation	radius of drainage	as needed	if gas drainage is occurring, there would be a communitization agreement, drilling of protective wells on Indian lands, or different spacing, to protect the Indian minerals from drainage

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
LANDS AND REALTY	rights-of-way	areawide	site inspection	site and surrounding area	minimum of once during construction, every 3-5 years during operation	
MINERALS	geophysical Notice of Intent	areawide	line or area inspection	operations conducted in compliance with Notice of Intent	minimum of once during operations	violation of regulations, change from approved Notice of Intent, unnecessary or undue degradation
Oil and Gas	geophysical Notice of Completion	areawide	line or area inspection	operations conducted in compliance with Notice of Completion	minimum of once during plugging, once after reclamation	violation of regulations, change from approved Notice of Completion unnecessary or undue degradation
	Application for Permit to Drill	areawide	site inspection	operations conducted in compliance with Application for Permit to Drill	minimum of once and as necessary	violation of regulations, change from approved Application for Permit to Drill
	Sundry Notice	areawide	site inspection	operations conducted in compliance with Sundry Notice	as necessary	violation of regulations, change from approved Sundry Notice unnecessary or undue degradation
	natural gas	areawide	drainage evaluation	radius of drainage	as needed	if gas drainage is occurring, there would be a communitization agreement, drilling of protective wells on Federal lands, or different spacing, to protect the federal minerals from drainage
	produced water disposal	areawide	site inspection	operations conducted in compliance with permit	minimum of once annually or as necessary	violation of regulations, change from approved permit, unnecessary or undue degradation
	spill	areawide	site inspection	area cleaned up, reclaimed	minimum of once after event and as necessary	violation of regulations, change from approved permit, unnecessary or undue degradation
	plugged, abandoned wells	areawide	site inspection	operations conducted in compliance with permit	minimum of once during operations	violation of regulations, change from approved permit, unnecessary or undue degradation
	abandoned well reclamation	areawide	site inspection	operations conducted in compliance with permit	minimum of once and as necessary until reclamation complete	violation of regulations, change from approved permit, unnecessary or undue degradation

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
PALEONTOLOGY	significant paleontological localities, ACECs	areawide	inspection of area disturbed	fossil locality degradation caused by human activity- percentage of locality	once yearly	any noticeable trend indicating increased disturbance, such as illegal excavation or vandalism
			inspection of displaced or altered area	environmental degradation, such as erosion or trampling- number of fossils	once yearly	accelerated loss or damage to significant fossils
RECREATION	general recreation use	areawide with emphasis on dispersed use of undeveloped recreation sites	area inspections to look for vandalism, resource abuse, and install photo points	site condition	biannual (June and October) - photograph annually	user conflicts, resource degradation, or safety hazards
	concentrated recreation use	special recreation management areas, sites with recreation facilities	visitor registration, traffic counters estimates, photo points	visitor days, site condition	visitor registration boxes, counters checked once monthly at the minimum, weekly or biweekly during heavy use periods, photograph annually	increased visitor use/year or sustained use that requires additional or improved facilities
		areawide commercial, competitive activities	administrative review, site inspection for complexes with permit stipulations	permit stipulations, resource condition success of reclamation	on site during competitive events, periodic site inspection for commercial operations, administrative review annually	violation of permit stipulations, irreparable resource damage, compromise of visitor safety, recreation experience
SOILS	upland erosion	discharge points, well pads, roads, other disturbance areas	visual inspection of disturbed area	site condition or area of impact	once to twice yearly	accelerated erosion, rills, gullies
	stream bank erosion, modification	ephemeral drainages, intermittent streams, main stem of rivers in effected areas	visual inspection of streams, drainages - measurements of various fluvial characteristics	site condition or area of impact	every two years	bank avulsion, loss of stream bank vegetation, or change in vegetation characteristics outside of expected norm
	saline seeps	water discharge, holding areas	visual inspection of soil surface, vegetation	area of impact or site condition	1 - 2 times yearly	visible salt crusting or vegetation changes
	compaction	areas effected by extraction activities	penetrometer or visual inspection	pounds per square inch	1 - 2 times yearly	compaction outside permitted disturbance zone

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
VEGETATION						
	ecological status	areas affected by disturbance through the pre-production, production, post-production processes	ecological site method in key areas	composition, production compared to potential natural community for each site	pre-development ecological status baseline data	status is reduced by 15% or a drop in class
	trend	areas affected by disturbance through the pre-production, production, post-production processes	any suitable methods as described in TR 4400-4 or the National Range Handbook	apply to the technique selected, may include number of individuals per unit area, percent cover, percent frequency, or percent species composition	every 3 to 5 years after the collection of ecological status baseline data	a change in the direction of trend away from management
Noxious Weeds	trend	areas affected by disturbance through the pre-production, production, post-production processes	Montana Noxious Weed Standards	acres, plants per square feet, species	yearly (through post production reclamation)	10 percent increase beyond objectives for the area/new species occurrence or infestation
Riparian/ wetlands	condition, trend, age class structure, streambank alteration	any federal action (including split estate)	photo plot, estimate key areas by sight inspection, Cole Browse Method, Key Forage Method, other methods found in Technical References (TR4400-3, TR4400-4, TR4400-7, TR1737-3, TR1737-8, TR1737-9) including MRWA (Montana Riparian Wetland Association) Riparian Inventory for areas not previously inventoried MRWA PFC on inventory areas	percent species composition, percent in each age class, percent utilization, height, percent of the streambank	based on activity plan schedule- a minimum of once every five years	trend away from objective or when no improvement occurs, in unsatisfactory habitat condition/functioning at risk with downward trend
Special Status and T&E Plant Species	condition	areas affected by disturbance through the pre-production, production, post-production processes	Montana Natural Heritage Program and visual inspection	presence & condition	once during the growing season, at a minimum	downward trend in plant condition caused by O&G activities

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
WILDLIFE (see also “Wildlife Outline” at the end of this appendix)						
Aquatic Biological Diversity (flora/fauna)	population diversity	intermittent/perennial streams associated with produced water discharge	stream sampling	diversity index	every three years	downward trend overall stream biological diversity
Big Game	seasonal habitat use	project area plus 1 mile buffer	air/ground field inspection	occupancy	annually	downward trend in habitat occupancy
Black-footed Ferret	occupancy	prairie dog towns larger than 80 acres located within 0.5 mi. of proposed activity	ground inspection	occupancy	determined on a site-specific basis in coordination with FWS	habitat decline or prairie dog fatalities caused by oil & gas activities - occupancy of black-footed ferrets would be managed in a Black-Footed Ferret Management Plan
Burrowing Owl	active nest locations	specific project area plus .5 mi. buffer (within active prairie dog town)	ground inspection	occupancy	Twice yearly (June-August)	human-caused disturbance to owls related to oil & gas activities such as vandalism and harassment
Grey Wolf	occupancy	Billings RMP area	air/ground field surveys	number of sitings	annually until reintroduction objectives are met	1 to 3 year downward trend in production or occupancy
Migratory Non-game Birds	occupancy	project area plus 0.25 mi buffer	ground observations	occupancy	periodically	documented fatalities caused by oil & gas activities
Mountain Plover	active nest locations	specific project area plus 0.5 mi. buffer (within areas less than 4" average vegetation height and prairie dog towns)	ground inspection	occupancy	twice yearly (April 15 - June 30)	human-caused disturbance to mountain plovers related to oil & gas activities such as vandalism and harassment
Prairie Dog	active prairie dog colony	specific project area plus 0.5 mi buffer	air/ground inspection	occupancy	annually	documented prairie dog fatalities caused by oil & gas activities
Raptors	active nest locations (excluding burrowing owls)	project area plus 1 mi. buffer	air/ground field inspection	number of nests	every 3 years	downward trend in occupancy
	raptor productivity (including Burrowing Owl)	active nests within 1 mi of project disturbance plus 1 mi. buffer	air/ground field inspection	nest success/failure species productivity	annually	downward trend in nest success, overall productivity
	raptor productivity-selected undeveloped comparison area	project area	air/ground field inspection	nest success/failure species productivity	every five years	information used as support to determine downward trend

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Information Warranting a Decision Change
Sage Grouse	sage grouse lek location	CBM overall project area	aerial field inspection	number, location of leks	every five years	downward trend in habitat occupancy
	sage grouse lek attendance	specific project development areas plus 2 mi. buffer	air/ground field inspection	number of males/lek	annually	downward trend in lek attendance
	sage grouse winter habitat	project area plus 2 mi. buffer	air/ground field inspection	occupancy	annually	downward trend in habitat occupancy or quality caused by oil & gas activities
Special Status Species (BLM & MNHP lists)	occupancy	specific project area plus 1 mi. buffer	ground field inspection	occupancy	annually at a minimum via species habitat requirements	downward trend in habitat occupancy or quality caused by oil & gas activities
Threatened, Endangered and proposed species other than previously described	occupancy, productivity	CBM overall project area	air/ground field inspection	occupancy	determined on a site-specific basis in coordination with FWS	habitat decline or fatalities caused by oil & gas activities - occupancy of specie would be managed in a site-specific Management Plan

REGIONAL-SCALE MONITORING OF POTENTIAL EFFECTS OF COAL BED METHANE DEVELOPMENT ON WATER RESOURCES

Prepared by the Technical Advisory Committee for the Powder River Basin Controlled Groundwater Area

Introduction

Coal bed methane (CBM) is released from coal seams by pumping groundwater from coal seams to lower ground water pressures. The coal seams targeted for CBM development in the Powder River Basin constitute important regional aquifers that provide water for domestic, livestock, agricultural, and industrial uses. Consequently, CBM production will probably affect existing water uses in the Powder River Basin, although the extent and magnitude of effects are difficult to predict.

The Montana Board of Oil and Gas Conservation (MBOGC) requires, through its Order No. 99-99, that CBM producers submit field development plans that include groundwater characterization and monitoring. In addition to complying with existing MBOGC rules for wildcat gas wells, CBM producers are required to describe baseline hydrologic conditions, to inventory existing wells and springs, to offer water mitigation agreements to existing water users, and to monitor water production and shut-in water pressures within coal bed methane fields. Water mitigation agreements must be offered for a minimum of one-half mile (expanded to one mile in Mont. Code Ann. 85-2-521) from CBM fields or greater distances if effects extend farther. The U.S. Environmental Protection Agency (EPA) requires monitoring under permits for Class V injection wells used to re-inject water produced during CBM production. Specific requirements of Class V injection permits may include monitoring of injection pressure, injection rate and total volume at injection wells, and ground water elevations in monitoring wells.

There are no clear regulatory requirements for monitoring effects to ground water levels or spring flows outside the one-mile minimum specified by MBOGC or the area affected by Class V injection wells. Groundwater monitoring conducted by CBM producers within and near CBM fields, as required by MBOGC or the U.S. EPA, will not reveal broad regional effects. Therefore, regional-scale monitoring needs to be conducted outside areas of potential CBM development to allow potential effects to be evaluated before, during, and after the period of CBM production. In addition, the spacing of monitoring sites and the

frequency of monitoring needs to be sufficient to distinguish potential effects attributed to CBM development from potential effects attributed to other water users, and from ambient/seasonal variations in ground water levels and spring flows.

The purpose of this document is to establish design criteria for a regional-scale monitoring program intended to detect potential effects of CBM development on existing water uses. The objectives of the regional scale monitoring program are to characterize baseline hydrologic conditions, detect changes in ground water levels and flows from springs attributable to CBM development, and verify recovery of ground water levels after CBM development ends. Regional-scale monitoring of wells and springs is intended to augment and compliment field-scale monitoring established under MBOGC Order No. 99-99 or EPA UIC Class V injection well permits.

Criteria for selecting locations and spacing for monitoring sites, consisting of wells and springs, and monitoring practices are proposed here to ensure that long-term monitoring is sufficiently comprehensive to detect effects that CBM development might have on ground-water systems. Priorities are proposed to coordinate monitoring with the pace of development and the need to evaluate potential effects, and recommendations are presented for implementing monitoring and managing monitoring data. The criteria and monitoring recommendations described below are not meant as rigid rules, but rather are intended to guide qualified personnel in selecting monitoring locations and implementing monitoring that meet the objectives stated above.

Criteria and Monitoring Practices

The portion of the Powder River Basin underlain by coals of the Tongue River Member of the Fort Union Formation is generally considered to have potential for CBM development. Within this area, however, CBM is less likely to be developed from coal seams with limited thickness and ambient ground water pressures; conditions that indicate limited potential for gas

production. These areas, located primarily within two to five miles of coal outcrops, should be targeted for monitoring wells.

The Anderson-Dietz, Canyon, Wall, and Knobloch are the four primary coal seams within the Tongue River Member (Map 1). Separate monitoring sites located within five-miles of the outcrops of each of these coal zones are proposed. Clusters of wells will be completed in different coal zones where outcrop areas overlap and, where present, springs will be monitored near each monitoring site. Monitoring wells will need to be completed in alluvial aquifers, in areas where water from CBM production is discharged to surface impoundments, or in selected sandstone aquifers within coal outcrop areas or CBM fields (when not required by MBOGC or the U.S. EPA). Springs that are current, historical, or potential sources of water but located away from established monitoring sites may also be monitored.

The focus of overall monitoring of the potential effects of CBM development will change as CBM fields mature, and gas production declines and eventually ends. Monitoring performed by CBM operators that is required by MBOGC or the U.S. EPA, will gradually be discontinued as portions and eventually all of fields are played out. Abandoned producing wells or monitoring wells within CBM fields should be incorporated into the regional monitoring program as field mature, in order to effectively monitor post-production groundwater recovery in affected areas.

The need for detailed information, and the cost of installing monitoring wells and monitoring ground water-levels and spring flows, will need to be balanced to determine the ultimate spacing between monitoring sites. At a minimum, one monitoring site will be located in every township that lies within five miles of the outcrop of a targeted coal. The ultimate spacing of monitoring sites might be greater, depending on site-specific conditions such as thickness of coal zone and importance of coal or sandstone aquifers, and priorities for monitoring outlined below.

Monitoring wells may be newly constructed wells, existing monitoring or water supply wells, or abandoned or transferred CBM production wells. Ground-water levels in monitoring wells and flows of springs will need to be measured monthly to obtain a sufficient data record to characterize patterns of seasonal changes in ground-water level or spring flows, before the wells or springs can be effected by CBM development. Typically two to three years of monitoring record is desirable. Monitoring frequency should be reduced once a sufficient record of baseline conditions is established.

Priorities

The following priorities are proposed for initiating monitoring and selecting monitoring well density and frequency, to ensure that a regional ground water monitoring program is established in advance of anticipated CBM development and before potential effects of CBM development can occur.

- *Sequence of CBM development*—Areas most likely to be effected by CBM development first are the highest priority for initiating monitoring. CBM development is expected to focus initially on the Anderson-Dietz coal zone and, therefore, monitoring near its outcrop should begin first. Records of exploration wells, pipeline plans, and identification of prospective coal zones can provide more specific information regarding the sequence of CBM development.
- *Extent of water use*—Areas where water from coal-beds is heavily used are high priorities for monitoring. Within the general area of the Anderson-Dietz outcrop, areas of concentrated water use, such as the headwaters of Otter Creek, will need immediate and more intensive monitoring.
- *Proximity to political boundaries*—Monitoring should be established along political boundaries, specifically the Montana-Wyoming border and reservation boundaries, in order to detect potential effects from areas outside the regional monitoring network.
- *Sensitivity or hydrogeologic setting*—More intensive monitoring will be necessary where faulting or complex stratigraphy result in complex hydrogeologic settings.
- *Existing monitoring networks*—Monitoring should be re-established at monitoring wells near operating coal mines and coal mining prospects studied in the past. New monitoring well construction should focus on areas where wells are not available.
- *Land or mineral ownership*—Monitoring should be conducted at sites with stable land and/or mineral ownership. For example, federally owned land, or other land with long-term access easements provide more reliable long-term access for monitoring.

Implementation and Data Management

An important goal of the proposed regional monitoring program is to ensure that all monitoring data collected are made readily accessible to the public. The regional monitoring program can, and probably will, be conducted by more than one agency, with funding from various sources. However, one agency or interagency will need to coordinate or review all regional monitoring activities in order to assure that monitoring occurs where needed and to prevent duplication. Data from field-scale monitoring pursuant to MBOGC Order 99-99 and EPA UIC Class V injection well permits will need to be managed similarly. A further responsibility of the lead agency or group should be to ensure that regional- and field-scale monitoring data are compiled and made available to the public in the Ground-Water Information Center (GWIC) and the National Resource Information Systems (NRIS).

Summary of Recommendations

A regional-scale monitoring program is necessary to characterize baseline hydrologic conditions, to detect potential effects resulting from CBM development, and to verify recovery of ground water levels after the period of CBM development. The following constitutes the main elements of a regional-scale monitoring program that should accomplish these objectives:

- Monitoring is needed to augment and compliment field-scale monitoring established under MBOGC Order No. 99-99 and EPA UIC Class V injection permits.

- Groundwater levels need to be measured in wells in coals and overlying or underlying sandstone aquifers at locations near coal outcrops outside of areas of prospective CBM development.
- Groundwater levels need to be measured in wells in alluvial aquifers in areas where water CBM production is discharged to surface impoundments, or selected sandstone aquifers within CBM fields.
- Flows from springs need to be monitored when they are near well monitoring sites or if they are important water sources.
- Groundwater levels need to be measured in abandoned or transferred CBM wells as CBM fields mature.
- Monitoring sites need to be located in every township near coal outcrops at a minimum.
- Groundwater levels in wells and flows from springs need to be measured monthly to characterize ambient seasonal patterns.
- Monitoring sites need to be established to ensure that the regional monitoring program is implemented in advance of localized CBM development and, consequently, that potential effects can be detected.
- One oversight agency or interagency group responsible for collecting and compiling comprehensive and consistent data should implement the proposed regional monitoring program.
- Monitoring data need to be compiled and made available to the public through GWIC and NRIS.

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Monitoring Appendix

Map 1.

Conceptual map showing recommended areas for a regional-scale coal-bed methane monitoring program

Montana Department of Natural Resources
 Technical Advisory Committee for the Powder River Basin Controlled Ground-Water Area

Legend

Anderson

Canyon

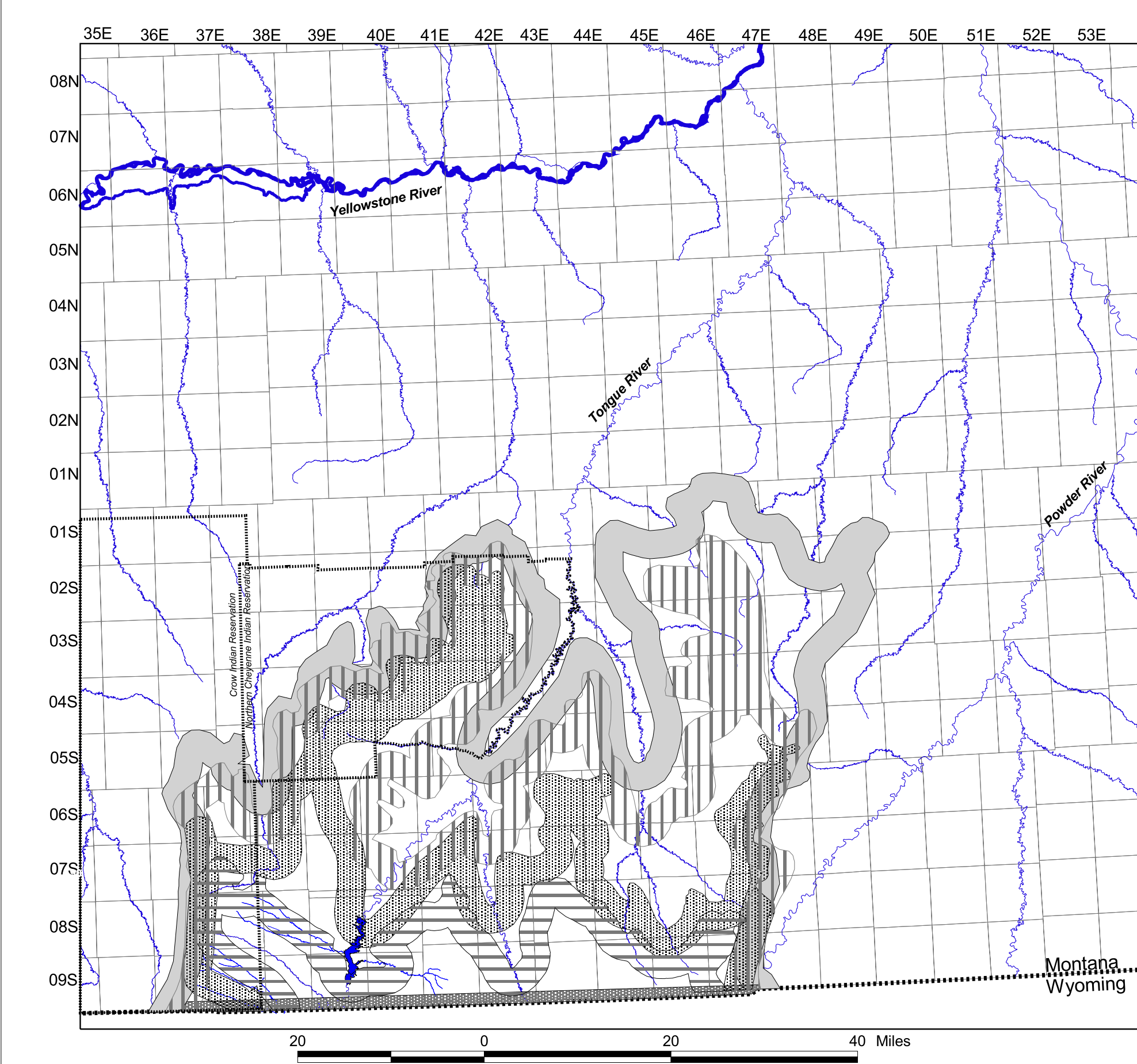
Wall

Knobloch

State-line monitoring area

This map is part of a report prepared by the Montana Department of Natural Resources, Technical Advisory Committee for the Powder River Basin controlled ground-water area, titled: Regional-scale monitoring of potential effects of coal bed methane development on water resources. The Technical Advisory Committee proposes a minimum of 1 monitoring site in each township within three - five miles of coal outcrops. In addition, monitoring is proposed near the Montana-Wyoming border.

The Anderson, Canyon, Wall and Knobloch coal seams are the four primary seams within the Tongue River Member of the Fort Union Formation in the Montana portion of the Powder River Basin. Shaded zones represent areas that are generally 3 miles or less from these respective coal outcrops. Separate ground-water monitoring sites are proposed within each of these coal zones to study the potential effects of coal-bed methane development. Actual site locations will be based on detailed geology and field conditions.



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Wildlife Monitoring and Protection Plan

This draft document outlines the proposed principles and process for implementing a Wildlife Monitoring and Protection Plan (WMPP) during CBM development in the Powder River and Billings RMP areas. A detailed, complete plan will be included in the Final EIS.

The goal of the WMPP is to avoid or minimize impacts to wildlife and serve as a communication tool to foster cooperative relationships among CBM industry, landowners, and the agencies. This plan addresses a large geographic area composed of diverse wildlife habitats and unique situations, therefore, it is programmatic in nature; however, the need to provide management recommendations and guidance to conserve species and habitats remains. A site-specific plan, which follows the guidance provided in this programmatic document, will be required as part of each Project Plan. Implementation of this plan during the course of project development and operations would allow land managers and project personnel to achieve desired levels of wildlife productivity simultaneously with the development of natural gas reserves.

Plan Purpose

The plan serves many purposes, which include but are not limited to:

- Establish a framework to cooperate, report, and make decisions
- Determine the effectiveness of mitigation measures contained in the BLM Record of Decision and CBM Project Plans
- Determine needs for inventory, monitoring and protection measures
- Provide guidance and recommendations for the conservation of wildlife species
- Establish protocols for biological clearances of special status species
- Meet the terms and conditions of the Biological Opinion
- Provide a mechanism for a rapid response to change environmental conditions
- Validate predictive models used in the EIS and revise the models/projections as necessary based on field observations and monitoring

- Build a foundation for proactive and constructive participation in future decision making

Programmatic Guidance for the Development of Project Plans

It is proposed that operators will develop Project Plans that incorporate the programmatic guidance in this WMPP. This guidance may change over time if monitoring indicates it is not effective or unnecessary. Within the Project Plans, operators will include baseline inventory in areas where wildlife inventory has not been completed and demonstrate how their project design minimizes or mitigates impacts to surface resources and meets objectives for wildlife.

The following list of draft guidance is provided to the reader as examples of how project plans will incorporate conservation needs for wildlife species. These types of conservation actions offer flexibility for local situations and help minimize or eliminate impacts to the species of interest.

- 1) Use the best available information for locating structures near important wildlife breeding, brood-rearing, and winter habitat based on the following considerations:
 - a. Size of structure(s),
 - b. Life of the operation, and
 - c. Extent to which impacts would be minimized by topography.
- 2) Concentrate energy-related facilities when practicable.
- 3) Locate storage facilities, generators and holding tanks outside the line of sight of important sage grouse breeding habitat.
- 4) Develop a comprehensive Project Plan prior to expanded development activities to minimize road densities.
- 5) Develop a route utilizing topography, vegetative cover, site distance, etc. to effectively protect identified sage grouse habitat or other important wildlife habitat in a cost efficient manner.

MONITORING APPENDIX
Wildlife Monitoring and Protection Plan

- 6) Apply mitigation measures to reduce mountain plover, swift fox, or sage grouse mortality cause by increased vehicle traffic. Construct speed bumps, use signing, or post speed limits as necessary to reduce vehicle speeds near leks or other important wildlife habitats.
- 7) Avoid, where possible, locating roads and power lines in crucial sage grouse breeding, nesting and wintering areas.
- 8) Use minimal surface disturbance to install roads and pipelines and reclaim sites of abandoned wells to restore natural plant communities.
- 9) Site new power lines in existing disturbed areas wherever possible.
- 10) Minimize the number of new powerlines in sage grouse habitat.
- 11) Remove unneeded structures and associated infrastructure when project is completed.
- 12) If possible, minimize maintenance and related activities in sage grouse breeding/nesting complexes—15 March to 15 June—between the hours of 4:00-8:00 a.m. and 7:00-10:00 p.m.
- 13) Protect, to the extent possible, natural springs from disturbance or degradation.
- 14) Design and manage discharge impoundments so as not to degrade or inundate sage grouse leks, nesting sites, wintering sites, or other special status species habitats.
- 15) Develop offsite mitigation strategies in situations where fragmentation or degradation of special status species habitat is unavoidable.

Implementation

Plan implementation will begin with the issuance of the Record of Decision. It will remain in effect for the life of the project unless there is sufficient evidence that wildlife populations and productivity are adequately protected. The WMPP will undergo a major review every five years to determine its effectiveness. A cooperative agreement among cooperators will be signed on an annual basis to include specific work components of the current year's work.